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EXAMINER	
GREEN, RICHARD R	

ART UNIT	PAPER NUMBER
3644	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/581,328	MUHLTHALER ET AL.	
	Examiner	Art Unit	
	Richard R. Green	3644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *8/27/2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *19-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *19-32* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *01 June 2006; 27 August 2008* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

The amendment filed 8/27/2008 does not fully address all of the objections to the drawings. Reference number 21b in fig. 3 is not mentioned in the specification, and the amendment to the specification on 8/27/2008 does not add it. All other objections related to reference numbers have been withdrawn.

Drawings

The drawings are objected to because they contain solid black shading. Solid black shading areas are not permitted under 37 C.F.R. 1.84(m), except when used to represent bar graphs or color. See MPEP 608.02 section V.

The drawings are objected to because they make unnecessary or improper use of shading. The use of shading in views is encouraged if it aids in understanding the invention and if it does not reduce legibility. Such shading is preferred in the case of parts shown in perspective, but not for cross sections. Spaced lines for shading are preferred. See 37 CFR. 1.84 (m) and (h)(3) for a full treatment on shading and hatching. See also 37 CFR 1.84 (l) relevant to reproductive quality of drawings, or MPEP 608.02, section V. As all of the figures are cross sectional schematics, shading for purposes of perspective is not necessary or preferred. Additionally, in the present application it detracts, rather than aids, in understanding the invention, and reduces legibility somewhat. If differentiation between materials is necessary to the invention, hatching under 37 CFR 1.84 (h)(3) is urged as opposed to grayscale shading.

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: 21b (figure 3).

Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

These are new rejections under 35 U.S.C. 112.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim **31** is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 31 recites the limitation "the cold storage unit" in the third line. There is insufficient antecedent basis for this limitation in the claim. This claim must either be dependent on claims 27, 28 or 30, be rewritten to refer to “a cold storage unit,” or else otherwise provide antecedent basis for a cold storage unit to overcome this rejection.

Claim Rejections - 35 USC § 102

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims **19-23 and 27-32** are rejected under 35 U.S.C. 102(b) as being anticipated by USPN-4000776 to Kroebig et al. (hereafter Kroebig).

Regarding claim **19,** Kroebig teaches an aircraft (the figure depicts a portion of a missile) having a cooling device for expelling heat from a heat source located in the interior of an aircraft (“component 12,” col. 1, line 49) to a heat sink (“missile skin 16,” col. 1, line 51), comprising:

a piping system (“heat pipe 10,” col. 1, line 49) sealed against the surrounding atmosphere, the piping system having a heat intake section thermally coupled with the heat sink (heat intake section may be the “evaporator section 19," col. 1, line 57, and the heat sink may be "the heat pipe cover … acts as the condenser,” col. 2, lines 11-13; col. 1, line 51 – col. 2, line 18 teach the interaction of these parts with the heat source and sink) and an essentially adiabatic conveyance section located there between ("wick 22," col. 1, line 55; col. 2, lines 11-18), whereby the piping system is filled with a heat conveyance medium (“liquid 21,” col. 1, line 54) which, when heat is received in the heat

intake section from the heat source, undergoes a transition from the liquid phase to the gaseous phase, then flows into the heat output section, then condenses when discharging heat to the heat sink, and then flows back into the heat intake section ("as the component temperature increases, it causes an evaporation of the working fluid which flows to the missile skin where it condenses giving up its latent heat. The condensate is returned to the evaporator through the wick," col. 2, lines 13-18); wherein said heat sink includes a section of an external wall of the aircraft ("cover 14 which forms part of the missile skin 16," col. 1, line 51; figure);

at least one heat exchanger which operatively couples the piping system to one of the heat source and the heat sink, thereby to cause heat transfer in at least one of the heat intake section and the heat output section, respectively (see figure, at 10; the walls of the heat pipe are considered to be a heat exchanger in that they do thermally couple both the heat source and sink with the piping system); and

a ventilator operatively connected to said at least one heat exchanger, the ventilator adapted to control the transfer of heat between said at least one heat exchanger and said one of the heat source and the heat sink (figure, at 31; col. 2, lines 3-29 teach that the bellows at 31 is adapted to control the transfer of heat between the walls of the pipes and the missile wall. Since this heat transfer takes place by the expansion of gas in a bellows, it may be considered to be a ventilator).

Regarding claim **20,** Kroebig teaches an aircraft in accordance with claim 19, whereby the piping system includes a closed pipe ("heat pipe 10," col. 1, line 49), one

end section thereof being the heat intake section and the other end section thereof being the heat output section (col. 2, lines 11-18), and

whereby both end sections are connected to one another via the conveyance section (see figure).

Regarding claim **21,** Kroebig teaches an aircraft in accordance with claim 19, whereby the heat source includes at least one of the following components: an electronic device in the aircraft (component 12, figure), an on-board kitchen in the aircraft, and a surface requiring cooling in the aircraft.

Regarding claim **22,** Kroebig teaches an aircraft in accordance with claim 19 further comprising a means for controlling the flow of the heat conveyance medium between the heat intake section and the heat output section (figure: the diameter of the pipe at 10 is considered to control the flow of liquid therein, as the mass flow through a pipe is a function of the density and velocity of a fluid and the cross sectional area of the pipe).

Regarding claim **23,** Kroebig teaches an aircraft in accordance with claim 22, said means for controlling further comprising a regulator valve operatively connected to the piping system, thereby to control the quantity of heat conveyance medium flowing to or from the heat exchanger (col. 1, line 55 – col. 2, line 2; the holes in the wick “which aid in the flow of steam from the evaporator to the condenser” all serve to control the flow of the liquid which is the heat conveyance medium, and may be considered valves in that they partially obstruct the passage of fluid through the pipe).

Regarding claim **27,** Kroebig teaches an aircraft in accordance with claim 19, further comprising a cold storage unit (chamber 29, col. 2, line 3; figure) provided between the heating source and the heat sink (The camber 29, is taught to store a bellows containing "a gas such as air," in col. 2, line 6, and is considered to comprise a cold storage unit, since the relatively cool temperature of the gas inside determines the state of operation of the heat exchanger of Kroebig).

Regarding claim **28,** Kroebig teaches an aircraft in accordance with claim 19, further comprising a cold storage unit provided in the heat source (the component 12 is considered to comprise a cold storage unit, in that, as the heat source it contains matter which is intended to be cooled, and which may additionally be considered to be relatively cool when compared to the surface of the sun).

Regarding claim **29,** Kroebig teaches an aircraft in accordance with claim 19, whereby the piping system forms a closed circuit which connects the heat source and the heat sink via a feed line (heat pipe 10) and a discharge line (wick 22), respectively (see figure).

Regarding claim **30,** Kroebig teaches an aircraft in accordance with claim 27, whereby the cold storage unit (figure: chamber 29) is located in a special circuit (the chamber is considered to be in a reaction circuit comprising bellows 31 and spring 35) with a special piping system (bellows 31 contain air or “a heat expandable fluid," in col. 2, line 7, and may be considered a special ventilator piping system).

Regarding claim **31,** Kroebig teaches an aircraft in accordance with claim 19, whereby when the aircraft is in rest condition, the heat sink is located geodetically

higher than the cold storage unit and the heat source (see figure: the missile skin is higher than the component and the bellows).

Regarding claim **32,** Kroebig teaches a method for the discharge of heat from a heat source (component 12, figure) located in the interior of an aircraft (a missile) to a heat sink (missile skin 16, figure), the aircraft including a piping system sealed against the surrounding atmosphere (heat pipe 10, figure), the piping system having a heat intake section ("evaporator section 19," col. 1, line 57) thermally coupled to the heat source and a heat output section ("the heat pipe cover … acts as the condenser," col. 2, lines 11-13) thermally coupled to the heat sink with the heat sink (col. 1, line 51- col. 2, line 10), and an essentially adiabatic transport section located there between (figure, at 22; "wick 22," col. 1, line 55), the piping system being filled with a heat conveyance medium (figure, at 21; "liquid 21," col. 1, line 54) which, when heat is taken from the heat source in the heat intake section undergoes a transition from the liquid phase to the gaseous phase, then flows into the heat output section, then condenses as heat is discharged to the heat sink again and then flows back into the heat intake section ("as the component temperature increases, it causes an evaporation of the working fluid which flows to the missile skin where it condenses giving up its latent heat. The condensate is returned to the evaporator through the wick," col. 2, lines 13-18), wherein the heat sink includes a section of an external wall of the aircraft ("cover 14 which forms part of the missile skin 16," col. 1, line 51; figure), comprising:

causing, via at least one heat exchanger which operatively couples the piping system to one of the heat source and the heat sink, heat transfer in at least one of the

heat intake section and the heat output section, respectively (see figure, at 10; the walls of the heat pipe are considered to be a heat exchanger in that they do thermally couple both the heat source and sink with the piping system); and

controlling, via a ventilator the transfer of heat between said at least one heat exchanger and said one of the heat source and the heat sink (figure, at 31; col. 2, lines 3-29 teach that the bellows at 31 is adapted to control the transfer of heat between the walls of the pipes and the missile wall. Since this heat transfer takes place by the expansion of gas in a bellows, it is considered to be a ventilator).

Claims **19-21 and 24-32** are rejected under 35 U.S.C. 102(b) as being anticipated by USPN-2499736 to Kleen.

Regarding claims **19 and 31,** Kleen teaches an aircraft having a cooling device ("refrigerating system," col. 1, line 44) for expelling heat from a heat source located in the interior of an aircraft ("cargo space," col. 1, line 55) to a heat sink ("low-temperature ambient air," col. 2, lines 18-19), comprising:

a piping system sealed against the surrounding atmosphere ("hermetically confined within a closed circuit or tube" col. 1, lines 48-50), the piping system having a heat intake section ("vaporizing zone," col. 1, line 52) thermally coupled with the heat sink ("thermally associated," col. 1, line 52) and an essentially adiabatic conveyance section located there between ("intermediate connecting section 13," col. 2, lines 47-48; fig. 1), whereby the piping system is filled with a heat conveyance medium ("vaporizable refrigerating medium or agent," col. 1, lines 48-49) which, when heat is received in the

heat intake section from the heat source, undergoes a transition from the liquid phase to the gaseous phase, then flows into the heat output section, then condenses when discharging heat to the heat sink, and then flows back into the heat intake section (col. 3, lines 10-17); wherein said heat sink includes a section of an external wall of the aircraft (fig. 6: the ambient air which vents through the cooling device of Kleen is the primary heat sink in the device, however it is inevitable that some heat transferred to the ambient air will be transferred back to the mouth of the exit vent, heating it, and in that manner, the section of the external wall of the aircraft around the exit of the vent duct between numerals 32 and 33 acts as a heat sink as well);

at least one heat exchanger which operatively couples the piping system to one of the heat source and the heat sink, thereby to cause heat transfer in at least one of the heat intake section and the heat output section, respectively (fig. 6, at 14 and 17; col. 2, lines 52-55 teach that fins 14 act as heat exchangers for the condenser, and col. 3, lines 7-9 teach that fins 17 are heat exchangers for the evaporator); and

a ventilator operatively connected to said at least one heat exchanger, the ventilator adapted to control the transfer of heat between said at least one heat exchanger and said one of the heat source and the heat sink (fig. 6; ventilator may be considered as duct 31).

Regarding claim **20,** Kleen teaches an aircraft in accordance with claim 19, whereby the piping system includes a closed pipe ("closed circuit or tube," col. 1, lines 48-50), one end section thereof being the heat intake section (fig. 6, item 11) and the other end section thereof being the heat output section (fig. 6, item 12), and whereby

both end sections are connected to one another via the conveyance section (fig. 6, visible bend in pipe).

Regarding claim **21,** Kleen teaches an aircraft in accordance with claim 19, whereby the heat source includes at least one component of an electronic device in the aircraft, an on-board kitchen in the aircraft, a surface requiring cooling in the aircraft, (col. 2, lines 4-5 describe cooling “perishable merchandise," which merchandise is considered to have surfaces requiring cooling).

Regarding claim **24,** Kleen teaches an aircraft in accordance with claim 19 further comprising: a temperature sensor (fig. 6, thermostat 38 or 41) adjacent the heat source (both 38 and 41 are in compartment B, the air therein being the heat source and adjacent the sensors) so as to detect the temperature thereof, the temperature sensor operatively connected to the cooling device so that the cooling device can respond to the temperature detected by the temperature sensor (both 38 and 41 are taught to control parts of the cooling system by the temperature recorded therein: 38 in col. 6, lines 54-72; 41 in col. 7, lines 17-32).

Regarding claim **25,** Kleen teaches an aircraft in accordance with claim 24 whereby at least one of the ventilator and the regulator valve is operatively connected to the temperature sensor and controlled in accordance with the temperature detected by the temperature sensor (figure 6: the shutters at 32 and 33 are taught to be controlled by the temperature recorded by sensor 38 in col. 6, lines 54-72, and thus control the amount of air flowing through ventilation duct 31).

Regarding claim **26,** Kleen teaches an aircraft in accordance with claim 25, further comprising a regulation device operatively connected to the ventilator and to the regulator valve so as to control at least one of the ventilator and the regulator valve in accordance with the temperature detected by the temperature sensor (shutters at 32 and 33 are taught to be controlled by an actuating mechanism, which is taught to be controlled by temperature sensor 38 in col. 7, lines 4-10, and may be considered a regulation device).

Regarding claim **27,** Kleen teaches an aircraft in accordance with claim 19, further comprising a cold storage unit provided between the heat source and the heat sink (cold accumulator 16 is considered to act as a cold storage unit, and is located between the heating source and the heat sink, as visible in fig. 6).

Regarding claim **28,** Kleen teaches an aircraft in accordance with claim 19, further comprising a cold storage unit provided in the heat source (fig. 6, at B; col. 1, lines 7-26: storage area B acts at the heat source, and is taught to contain cold perishables such as sea food).

Regarding claim **29,** Kleen teaches an aircraft in accordance with claim 19, whereby the piping system forms a closed circuit (fig. 3) which connects the heat source and the heat sink by means of a feed line ("vapor tube 25" col. 5, line 10; fig. 3 and a discharge line ("liquid return tube 24" col. 5, line 7; fig. 3) respectively.

Regarding claim **30,** Kleen teaches an aircraft in accordance with claim 27, whereby the cold storage unit is located in a special circuit with a special piping system (the cold storage unit can be considered to have a special piping system shown by the

pipes in the far left of fig. 6, and more visible as a separate piping system in fig. 4. This separate piping system when combined with its associated heat exchangers is considered to comprise a special circuit).

Regarding claim **31,** Kleen teaches an aircraft in accordance with claim 19, whereby when the aircraft is in rest condition, the heat sink is located geodetically higher than the cold storage unit and the heat source (this is visible in figures 4 and 6, when the heat sink is considered as the ambient air flowing through duct 31).

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims **24-26** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kroebig in view of USPN-5966951 to Hallin et al. (hereafter Hallin).

Regarding claims **24-26**, Kroebig teaches an aircraft in accordance with claim 19,

wherein the cooling device responds to specific temperatures (figure: when the temperature of the component rises past the boiling temperature of the liquid in the pipe, the liquid begins to boil in area 19 and starts the cooling system of Kroebig; another example of response to a specific temperature is in col. 2, lines 19-29) (relevant to claim 24);

wherein the ventilator is controlled in accordance with a specific temperature (col. 2, lines 19-29: the bellows will expand at a particular temperature) (relevant to claim 25);

further comprising a regulation device operatively connected to the ventilator and to the regulator valve so as to control the ventilator according to a specific temperature (figure: regulation device may be element 35; col. 2, lines 3-29 teach that the spring 35 holds the plate 27 and wick 22 against the heat pipe cover 14 throughout normal operation of the cooling device, however when the temperature inside the bellows is sufficient that the pressure from the expansion of gas is stronger than the pressure exerted by the spring, the plate and wick are retracted from the heat pipe cover; the spring controls the ventilator according to the temperature of the system) (relevant to claim 26);

Kroebig is silent on a temperature sensor operatively connected to the cooling device, ventilator or regulator valve. However, Hallin teaches:

a temperature sensor (Hallin fig. 4, 96) adjacent a heat source (fig. 4) so as to detect the temperature thereof, the temperature sensor operatively connected to a cooling device so that the cooling device can respond to the temperature detected by the temperature sensor (Hallin col. 6, lines 39-40, 46-60 describe how a cooling system is controlled with reference to the temperature recorded by the temperature sensor).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to install a temperature sensor as in Hallin in the cooling device of Kroebig adjacent the heat source of Kroebig for informational purposes, so that in the event that the device fails unexpectedly it will be possible to know whether the cooling device was adequately cooling the component. Once installed, the temperature sensor will be operatively connected to the ventilator and regulator valve, in that the temperature of

these components will affect the temperature of the component to which the temperature sensor is adjacent. The cooling device and ventilator will be controlled in accordance with the relevant temperature of the system, which temperature will be detected by the temperature sensor, and the regulation device will control the ventilator according to the temperature of the relevant temperature of the system, which temperature will be detected by the temperature sensor.

Response to Arguments

Applicant's arguments, see page 10 (first page of remarks), lines 10-14, filed 8/27/2008, with respect to the use of reference number 10 to describe both a pipe and a container in the specification page 10, lines 22 and 28 have been fully considered and are persuasive. This objection of the drawings has been withdrawn.

Applicant's arguments filed 8/27/2008 have been fully considered but they are not persuasive.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., an active control of heat transfer between a heat exchanger and a heat source component) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Applicant's assertion that the Kroebig reference is inoperative is respectfully traversed. Under 35 U.S.C. 282, the issued patent to Kroebig is assumed to be valid,

and therefor operative. Additionally, the prior art reference which expressly anticipates or makes obvious all of the elements of the claimed invention is presumed to be operable, and the burden is on Applicant to provide facts rebutting the presumption of operability; *In re Sasse*, 629 F.2d 675, 207 USPQ 107 (CCPA 1980). Applicant has provided only opinions and no facts to rebut the presumption of operability of the Kroebig reference.

Applicant's assertion that the Kleen reference lacks both a ventilator and the use of the external wall of the aircraft as a heat sink is respectfully traversed. Hopefully the present explanation will make the reference more clear. The examiner is considering the air duct of Kleen as a ventilator because it performs the act of ventilation. The cooling device of Kleen additionally will transfer some heat to a section of the external wall of the aircraft so that it may act as a heat sink, which the examiner has described regarding claim 19 under the rejection in view of Kleen. The previous Office Action did not address this, since the outer wall of the aircraft was one of several options for a heat sink required by the claims and only with the present amendment is it explicitly required.

Applicant's assertion that Kleen teaches away from using the outer skin of the aircraft as part of the heat sink is not relevant to a rejection under 35 USC 102(b).

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in

the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, motivations for the rejections are found in the knowledge generally available to one of ordinary skill in the art, as described in the new rejections under 35 USC 103(a).

Applicant's arguments with respect to new claims **19-32** not addressed above have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard R. Green whose telephone number is (571)270-

5380. The examiner can normally be reached on Monday - Thursday 8:00 am - 6:00 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Mansen can be reached on (571)272-6608. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Michael R Mansen/
Supervisory Patent Examiner, Art Unit 3644

/R. R. G./
Examiner, Art Unit 3644